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REMARKS

1. Reconsideration in view of the remarks and amendments herein is respectfully requested.

2. Claims 1-17, and 19-30 are remaining with the Application.
Claims 23-30 stand allowed. Claims 2 and 3 stand objected to as based on a rejected base claim, but would be allowable if rewritten in independent form including all of limitations of the base claim and any intervening claims. Claims 1, 4-17, and 19-22 stand rejected.

3. (Referring now to Item 1 of the Official Action) The disclosure stands objected to for the reason that various fatty acids such as oleic, linoleic, linolenic, and palmitic acids are not of vegetable origin. Additionally, the disclosure stands objected to because various acyl groups such as palmitoyl, arachidoyl, behenoyl, myristoyl, and margaroyl are not of vegetable origin. The examples in the application stand objected to for the same reasons.

Applicant hereby submits copies of several pages from the "Fats and Oils Handbook" by Michael Bockish (English Edition), AOCS Press (1998) ***(Reference 1)***. Page 64 of and 65 of the text provides vegetable oil sources for many of the above acids or acyl groups. Each of the above mentioned acids or acyl groups can be obtained from vegetable oils such as the following with the relevant page number in parenthesis:

Oleic acid–soybean (229), peanut (251), rapeseed (259), and palm kernel (277);
Linoleic- soybean (229), peanut (251), rapeseed (259), and palm kernel (277);
Linolenic- linseed (65), soybean (229), peanut (251), and rapeseed (259);
Palmitoleic- soybean (229), peanut (251), and rapeseed (259);

Palmitoyl (from palmitic acid)- soybean (229), peanut (251), rapeseed (259), and palm kernel (277);
Stearoyl - soybean (229), peanut (251), rapeseed (259), and palm kernel (277);
Arachidoyl (from Arachic acid) - soybean (229), peanut (251), and rapeseed (259);
Behenoyl – peanut (251); and
Myristoyl - soybean (229), and palm kernel (277).

For margaroyl, a dictionary definition of the term is enclosed from "Webster's Third International Dictionary" (Unabridged) G.C. Merriam & Co. , p. 1381,(1961) **(Reference 2)** – where it is noted that margaric acid is a mixture of stearic acid and palmitic acid. The vegetable sources for stearic acid and palmitic acid have already been given above.

All of the disclosed and claimed fatty acids or acyl groups appear to have vegetable sources. In view of this additional information, available in the open literature at the time of filing the application, it is respectfully submitted that the above objection is traversed and should be withdrawn.

4. (Referring now to Items 2 and 3 of the official action). Claims 6-17 and 19-22 stand rejected under 35 USC 112, first paragraph as failing to comply with the enablement requirement.

4A. One part of the rejection is based on the following: "Applicant cannot claim non-epoxidized esters in the dependent claims when the independent claim restricts the invention to epoxidized esters. Applicant respectfully traverses this part of the rejection.

Independent claim 1 is at issue here since claims 6-14 ultimately depend on Claim 1. Claim 1 has been amended at line 6, by the addition of the adjective "unsaturated" after "wherein said" to provide greater clarity. Antecedent is in the same line. Claim 1 at lines 5 and 6 requires that at least 80% of the fatty acids in the oil be "unsaturated". This means the remainder are saturated so that it is not possible to form epoxidized derivatives from the remainder. Thus claim 1 allows

both saturated and unsaturated fatty acids that are consequently epoxidized and nonepoxidized. Applicant respectfully further refers the Examiner's attention to lines 7 and 8. Claim 1 only requires that the "esterified unsaturated fatty acids" be "substantially fully epoxidized". Therefore "nonepoxidized fatty acids" such as those that are based on saturated fatty acids as in the dependent claims appear to fulfill the requirements of claim 1 and the dependent claims 6-14 appear to be proper.

Claims 6-14 depend on claim 1, it is submitted that the above discussion traverses the rejection for these claims.

Claims 15-17 have been cancelled.

With respect to claim 19, the claim requires only that at least one of the selected R's be epoxidized to fulfill the definitional requirements in the preamble. For the same reason dependent claim 20 appears proper.

With respect to claim 21, the claim requires only that at least one of the R's be epoxidized to fulfill the definitional requirements in the preamble. For the same reason dependent claim 22 appears proper.

Applicant having fully traversed the grounds for rejection, respectfully requests withdrawal of this part of the rejection.

4B. Another part of the rejection is based on: "Disoyate and tetrasoyate esters cannot contain non-soy acyl groups.

It is respectfully submitted that all of the acyl groups are of soy origin. It has already been shown above in Section 3 of these REMARKS that linoleoyl, oleoyl, linolenoyl, palmitoleoyl, palmitoyl, stearoyl, arachidoyl, myristoyl, and margaroyl acyl groups are all available from soybean sources. The acyl group behenoyl is likewise available from soybean sources. Referring now to the Codex Alimentarius Commission, Twenty-fourth Session, Geneva, Switzerland, 2-7 July, 2001 ***(Reference 3)***, Table 1 thereof on page 28 shows that behenic acid (C22:0) is present in the soybean oil samples tested from not detectable to up to about 0.7%. It is noted that behenic acid is designated as (C22:0, i.e. 22 carbons in length and having no double bonds) in *Reference 1*, page 64. In a publication by Nexsoy, the behenic acid content of soybean oil is given at 0.37% (Spectrum Foods, Inc., P.O.

Box 30, 801 Yale Ave., Unit 5B, Swarthmore, PA 19081) ***(Reference 4)***.

In like way the acyl groups in currently amended Claim 9 for the "mixture of epoxidized methyl soyates" are all obtainable from soy sources. This applies to all soybean oil derivatives herein.

Applicant, having fully traversed the grounds for rejection, respectfully requests withdrawal of this part of the rejection.

4C. Another part of the rejection is based on "A mixture cannot contain only one ingredient (claim 9)".

Applicant has amended claim 9 so that "soyate" is now in the plural to read "soyates". Antecedent is found within the claim. As the examiner has noted a mixture requires more than one ingredient. Therefore there must be more than one soyate present or there can be no mixture. Accordingly the claim is amended to include a plurality of soyates, and the rejection is respectfully traversed.

4D. Another part of the rejection is based on: "Furthermore the epoxidized and non-epoxidized ingredients, which could be "R"-s, if all valences had not been already occupied by soy, are not of vegetable origin.

The issue of non-vegetable ingredients has already been addressed earlier in Section 3 of the present REMARKS and appears to answer the rejection noted here.

Applicant, having fully traversed this ground for rejection, respectfully requests withdrawal of this part of the rejection.

4E. Another part of the rejection is based on: 'Claim 1 excludes non-epoxidized and/or not vegetable derived fatty acid products.

The issue of Claim 1 excluding non-epoxidized fatty acids has already been discussed in Section 4A of the present REMARKS. Therefore, <u>non-epoxidized</u> fatty acids that are <u>saturated</u> are not excluded.

With regard to the not vegetable fatty acid products it was shown in an earlier Section 3 of the present REMARKS that all the fatty acids and fatty acid products were of vegetable origin.

Applicant having fully traversed the grounds for rejection, respectfully requests withdrawal of this part of the rejection.

5. (Referring now to Items 4, 5 and 6 of the Official Action) Claims 1, 4-6, and 8-12 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Examiner has noted that in Claim 1, the phrase "a fatty acids" is grammatically incorrect. Applicant has deleted the "a" before "fatty acids".

The Examiner has noted that in Claim 4, penultimate line, the phrase "and mixtures of derivatives thereof" is indefinite. Applicant has deleted this phrase.

The Examiner has noted that in claims 5, 6, and 9, the phrase "said plasticizer composition" has no antecedent basis in claim 1. "Said plasticizer" is enough. Applicant has amended the claims to refer to "said plasticizer" only.

The Examiner has noted that in Claims 8, and 10-12 that the "said composition" should be replaced by "said plasticizer". Applicant has amended these claims accordingly.

Applicant thanks the examiner for the above helpful remarks and comments. Applicant having fully traversed the grounds for rejection, respectfully request withdrawal of this part of the rejection.

Applicant has found that claims 6 through 10, 12, 19, and 21 have a comma missing after "palmitoleoyl" in the Markush list. The comma has been added.

6. (Referring now to Items 7, 8, and 9 of the Official Action)

Applicant has cancelled independent claims 15-17.

7. New Claims

Applicant submits new claims 31 to 33.

Claim 31 uses the text of cancelled claim 15 as antecedent and is rewritten to depend on claim 1. Claim 31 now clearly provides that the plasticizer be a mixture. Antecedent for mixtures is found in the specification at page 7, line 24 to page 7, line 5. It is respectfully submitted that Claim 31 is patentable over the art as it further limits the plasticizer of claim 1 to a mixture of epoxidized pentaerythritol tetrasoyates.

Claim 32 uses the text of cancelled claim 16 as antecedent and is rewritten to depend on claim 1. Claim 32 now clearly provides that the plasticizer be a mixture. Antecedent for mixtures is found in the specification at page 7, line 24 to page 7, line 5. It is respectfully submitted that Claim 32 is patentable over the art as it further limits the plasticizer of claim 1 to a mixture of epoxidized propylene glycol disoyates.

Claim 33 uses the text of cancelled claim 17 as antecedent and is rewritten to depend on claim 1. Claim 33 now clearly provides that the plasticizer be a mixture. Antecedent for mixtures is found in the specification at page 7, line 24 to page 7, line 5. It is respectfully submitted that Claim 33 is patentable over the art as it further limits the plasticizer of claim 1 to a mixture of epoxidized ethylene disoyates.

All of the new claims appear to fall within the subject matter included in the examination up to now.

It is believed that the above amendments address the examiner's concerns regarding the claims. Accordingly it is respectfully submitted that the rejections have been traversed and that the remaining claims appear allowable.

8. Applicant hereby requests and petitions for a three month extension of time. The fee is enclosed herewith.

In light of the amendments and remarks herein, it is respectfully submitted that the present application appears to be fully in condition for allowance; therefore, allowance of the application is earnestly solicited. Applicant's undersigned attorney has made a good faith effort to meet the concerns expressed by the Examiner in the Official Action. If the Examiner still has some issues with the application, and has any suggestions as to how to address them, the Examiner is invited to call the Applicant's undersigned attorney at the phone number given below, so that those issues can be worked out.

Respectfully submitted,

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REFERENCE 1

Fats and Oils Handbook

Michael Bockisch
Hamburg, Germany

AOCS PRESS

Champaign, Illinois

This book is dedicated to my wife Gudrun to whom, in the course of doing this translation, revision, and update, I had to break my promise never to write a book again, and also to my son Benjamin and my daughter Valerie.

AOCS Mission Statement
To be a forum for the exchange of ideas, information, and experience among those with a professional interest in the science and technology of fats, oils, and related substances in ways that promote personal excellence and provide high standards of quality.

The paper used in this book is acid-free and falls within the guidelines established to ensure permanence and durability.

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Preface

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TABLE 2.6
Occurrence of Minor Fatty Acids in Different Oils (%)

In marine oil: herring oil[a]											
$C_{16:me-7}$	0.3	$C_{16:2\omega6}$	0.4	$C_{16:2\omega4}$	0.6	$C_{16:3\omega4}$	0.4	$C1_{6:4\omega1}$	0.6	$C_{18:1\omega5}$	0.4
$C_{18:2\omega4}$	0.1	$C_{18:3\omega6}$	0.3	$C_{18:3\omega3}$	0.9	$C_{20:0}$	0.1	$C_{20:1\omega9}$	0.3	$C_{20:2}$	0.2
$C_{20:4\omega6}$	0.4	$C_{20:4\omega3}$	0.4	$C_{22:2\omega6}$	0.2	$C_{22:5\omega3}$	0.4	$C_{24:1}$	0.4	Phytanic	0.2
In vegetable oil: rapeseed oil[b]											
$C_{14:1\omega9}$	tr	$C_{14:1\omega7}$	0.007	$C_{14:1\omega5}$	0.004	$C_{14:2\omega6}$	0.02	$C_{14:3\omega3}$	tr	$C_{15:0}$	0.02
$C_{15:1\omega10}$	0.02	$C_{15:1\omega10}$	0.01	$C_{15:1\omega8}$	tr	$C_{16:1\omega7}$	0.29	$C_{16:2\omega6}$	0.07	$C_{16:3\omega3}$	0.13
$C_{17:0}$	0.05	$C_{17:1\omega8}$	0.06	$C_{19:0}$	0.02	$C_{19:1\omega10}$	0.02	$C_{20:2\omega6}$	0.20	$C_{20:3\omega6}$	0.20
In animal fat: lard[b]											
$C_{13:0}$	0.08	$C_{15:0}$	0.02	$C_{17:0}$	0.29	$C_{19:0}$	0.03	$C_{21:0}$	0.004	$C_{23:0}$	0.02
$C_{23:0br1}$	0.008	$C_{24:0br1}$	0.004	$C_{25:0br1}$	0.02	$C_{26:0br1}$	0.02	$C_{12:1}$	0.02	$C_{14:1}$	0.03
$C_{15:1}$	0.01	$C_{17:1}$	0.22	$C_{19:1}$	0.06	$C_{21:1}$	0.004	$C_{22:3}$	0.02	$C_{22:5}$	0.02
$C_{20:0br4}$	0.02	$C_{22:0br4}$	0.02	$C_{24:0br4}$	0.03	$C_{26:0br4}$	0.03	$C_{28:0br3}$	0.09	$C_{28:0br4}$	0.20

[a]*Source:* Sigurgísladóttir and Pálmadóttir (1993).
[b]*Source:* Sebedio (1979).
[c]*Source:* Iverson *et al.* (1965).

TABLE 2.7
Occurrence of Fatty Acids[a]

Saturated fatty acids		
$C_nH_{2n}O_2$ n	Trivial name	Occurrence in common oils and fats *Sources with remarkable proportion* (% of total fatty acids)
4	Butyric	milk fat (3–5)
6	Caproic	milk fat (2–3), coconut oil (≤1)
8	Caprylic	milk fat (≤2), babassu oil (3–5), coconut oil (4–6), palm kernel oil (≤3), *cuphea painteri* (65–75), *hookeriana* (~65)
10	Capric	milk fat (3–4), babassu oil (4–7), coconut oil (6–9), *cuphea* species (88–92)
12	Lauric	coconut oil, palm kernel oil (45–50), Litsea sebifera (~95), *Cinnamonium inners* (~95), *cuphea tolucana* (~65)
14	Myristic	coconut, palm kernel, babassu oil (15–17), herring oil (4–8), nutmeg oil (≤77) *Gymnacranthera contracta* (~85), *Scyphocephalum ochocoa* (~80), *cuphea palustris* (~65)
16	Palmitic	coconut oil, palm kernel oil, babassu oil, sesame oil (7–10), cottonseed oil (17–25), milk fat (33–38), lard (20–30), tallow (25–40), herring oil (7–13) menhaden oil (15–30) *Myrica carolinensis* (~80), *Ochna sqarrosa* (~75), *Rhus succedanea* (~70)
18	Stearic	lard (16–24), tallow (15–30) *Canarium schweinfurthii* (85), *Garcinia* species (60–65)
20	Arachic	peanut oil (5–7), milk fat (2–4) *nephelium* species (>30)
22	Behenic	peanut oil (5–7), mustard seed oil (≤1,5) *lophira* species (20–35), *Psochocarpus tetragonolobus* (~20)
24	Lignoceric	peanut oil (≤3), mustard seed oil (≤1), *adenanthera pav.* (~30), *eleagnus angustifolia* (~20), *tamarindus indica* (~20)
26	Cerotic	*pentachletra macrophyllia* (~5), *rumex pseudonatronatus* (~3), *vermonia anthelmica* (~3)

Continued

TABLE 2.7
(Continued)

Monounsaturated fatty acids

$C_nH_{2n}O_2$ n	Trivial name	Occurrence in common oils and fats *Sources with remarkable proportion* (% of total fatty acids)
12	Lauroleic	sperm whale oil (4), thohaku nut oil
14	Myristoleic	milk fat, tissue fat, liver oil (≤1), whale oil (2,5), sperm whale oil (14) *pygnantus kombo* (20–23)
16	Palmitoleic	milk fat, tissue fat (≤5), fish oil (≤20), whale oil (≤15), sperm whale oil (≤27) *kermadecia sinuata* (~70), *doxantha unguis* (~65), *plumeria alba* (55–60)
18	Oleic	rapeseed oil (LEAR 55–65), peanut oil (45–65), sesame oil (35–50), corn oil (40–50), olive oil (55–85), goose fat (50–65) *amaranthus trivolor* (~90), *garcinia multiflora* (~88), *corylus avellana* (~85)
18	Elaidic	body fat of ruminants
18	Petroselinic	*Apium leptophyllum* (~85), *Deverra aphylla* (~85), *Umbelliferae* (18–70)
18	Vaccenic	butter fat (<2.5), beef tallow
20	Gadoleic	sperm whale oil (≤19)
20	Eicosenoic	jojoba oil (≤30), mustard seed oil (≤13), cod-liver oil (≤14) *Limanthes species* (60–75)
22	Erucic	rapeseed oil (HEAR 40–65), mustard seed oil (≤50) *Crambe abbessynicum* (~60), *hispanica* (~55)

Polyunsaturated fatty acids

$C_nH_{2n}O_2$ n	x	Trivial name	Occurrence in common oils and fats *Sources with remarkable proportion* (% of total fatty acids)
18	4	Linoleic	safflower oil (≤80), sunflower oil (≤75), poppy seed oil (≤65) *Myrianthus species* (88~94), *betula platyphylla* (~88)
18	6	Linolenic	herring oil (≤20), menhaden oil (≤30), linseed oil (£47) *Acacia lenticularis* (~80), *Euphorbia species* (75–78); (-linolenic: barley 1–2)
18	6	Elaeostearic	*Aleuritis species* (65–85), *Parinarium excelsum* (~60)
20	8	Arachidonic	cod-liver oil (≤25), herring oil (≤30), menhaden oil (≤29)
20	10	Timnodonic	fish oils, fish liver oil
22	10	Clupadonic	cod-liver oil (œ10), herring oil (≤23), menhaden oil (≤12), sardine oil (≤14)
22	12	Cervonic	fish oils

Special fatty acids n	Trivial name	Occurrence in common oils and fats *Sources with remarkable proportion* (% of total fatty acids)
18	Ricinolic	castor oil (≤95)
24	Nisinic	tunny oil
24	Nervonic	brain cerebrosides (70), *cardamine graeca* (> 50), *tropaeolum spp.* (> 40)
24	Cerebronic	brain cerebrosides (15)
24	2–Hydroxynervonic	brain cerebrosides (12)

[a]For the fatty acid composition of thousands of fats and oils of animal and vegetable origin, see among others Hilditch and Williams (1964) and Ucciani (1995).

TABLE 4.30
Fact File of Soybean Oil (Bean Oil)

German: Sojaöl		French: huile de soya		Spanish: aceite de soja
Relative density		(at 20°C; ref. water 20°C)		0.910–0.925
Refractive index		(n_D^{40})		1.466–1.470
Saponification value		(mg KOH/g oil)		189–195
Iodine value		(Wijs method)		120–143
Unsaponifiable matter		(g/kg oil)		<15
Melting point:	–9 to –11°C		Solidification point	–8 to –18°C

Solids content at	(°C/°F)	0/32	5/41	10/0	20/68	30/86	35/95
	(%)	0.5	0	0	0	0	0

World market price	(U.S. $/MT)	min	Ø	max
	1962–1995	157	440	1044
Price index (1995 average compared to average)	1962–1969	157	223	303
10 years ago 103%	1970–1979	220	487	303
20 years ago 104%	1980–1989	279	493	1044
30 years ago 262%	1990–1995	398	508	670

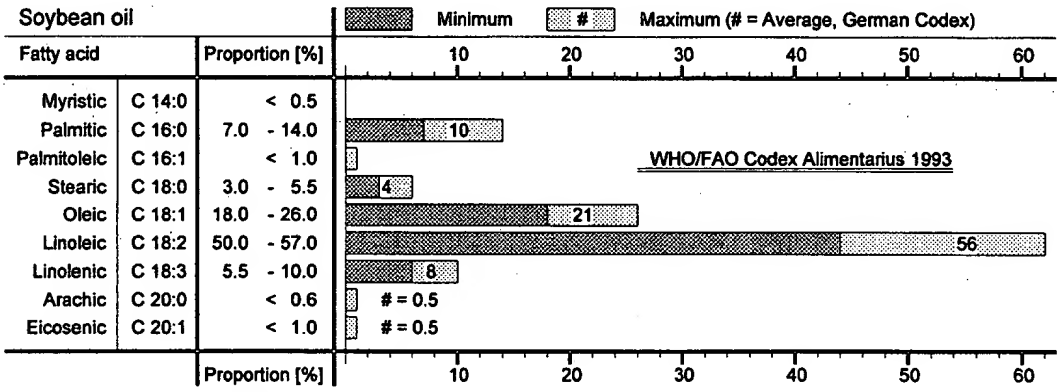

Fig. 4.49. Fact file of soybean oil (fatty acid composition).

4.3.2 Cottonseed Oil

4.3.2.1 Botany and History of Cotton. Cotton (*Gossypium*) is cultivated mainly for its fiber. The ratio of fibers to seed is ~1:2. The seed itself contains ~20–25% fat. From tools and fabrics found in excavations, it can be concluded that cotton has been cultivated for 4500–5000 years. Up to 600 B.C., India maintained a monopoly on cotton (called woven wind). In the period 600–500 B.C., cotton came to Egypt; later, in 333 B.C., it was imported to Europe by the Greek emperor, Alexander the Great. The oil content of the seeds is mentioned for the first time by the Greeks, Herodot and Theophrast. In the Middle Ages, the seed was rediscovered by Marco Polo (1271) who reported on it. Only in the 19th century did it become an item traded worldwide because only then did mechanical delintering, spinning and weaving equipment

TABLE 4.41
Fact File of Peanut Oil

German: Erdnußöl		French: huile d'arachide		Spanish: aceite de cacahuete			
Relative density		(at 20°C; ref. water 20°C)		0.914–0.917			
Refractive index		(n_D^{40})		1.460–1.465			
Saponification value		(mg KOH/g oil)		187–196			
Iodine value		(Wijs method)		80–106			
Unsaponifiable matter		(g/kg oil)		<10			
Cloud point:	–2°C		Solidification point		–2 to +3°C		
Solids content at	(°C/°F)	0/32	5/41	10/50	20/68	30/86	35/95
	(%)	<6	<5	<4	<2	0	0

World market price	(U.S. $/MT)	min	Ø	max
	1967–1994	236	686	1213
Price index (1995 average compared to average)	1967–1970	236	287	359
10 years ago 111%	1970–1979	329	707	1213
20 years ago 126%	1980–1989	446	754	1179
25 years ago 273%	1990–1995	543	987	1060

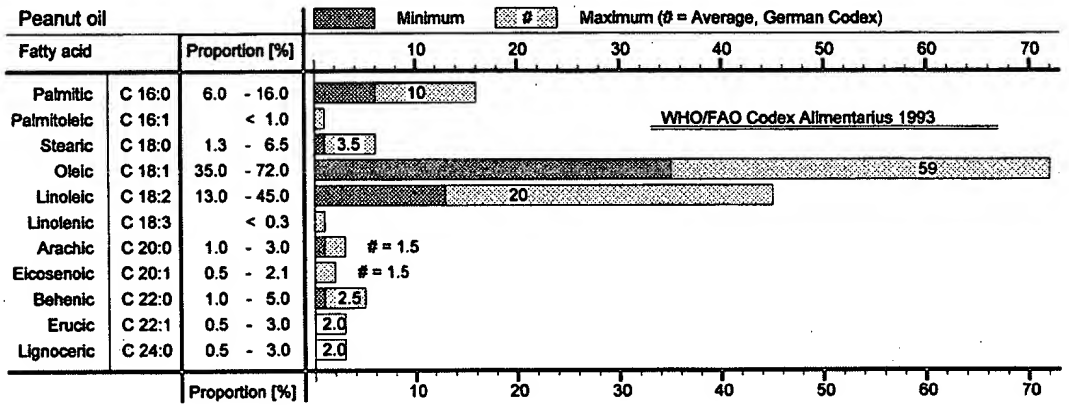

Fig. 4.73. Fact file of peanut oil (fatty acid composition).

4.3.5 Rapeseed

4.3.5.1 Botany and History of Rape. Rape (*Brassica napus, Brassica campestris*) is today cultivated mainly in Canada, Europe, India and China. It is much more durable than the other oilseeds, because it is able to withstand spring frost. It is therefore suitable for farming in the moderate climates of the north (or the far south).

Its origin is still not clear, but it appears to lie in Eurasia where it is already mentioned around 2000 B.C.; there is also a citation in Indian Sanskrit. In middle Europe, it is first mentioned in Holland in 1360 as "raepssaet."

Genotypes farmed today reach a height between 80 and 150 cm. Rape ripens 30–40 d after pollination. The pods have a length between 5 and 10 cm and are filled

TABLE 4.45
Fact File of Rapeseed Oil (LEAR)

German: Rapsöl	French: huile de colza	Spanish: aceite de colza
Relative density	(at 20°C; ref. water 20°C)	0.914–0.920
Refractive index	(n_D^{40})	1.465–1.467
Saponification value	(mg KOH/g oil)	182–193
Iodine value	(Wijs method)	110–126
Unsaponifiable matter	(g/kg oil)	<20
Crismer value		67–70
Brassica sterol	(% of total sterols)	>5

Cloud point:	–10 to –12°C			Solidification point		<<0°C	
Solids content at	(°C/°F)	0/32	5/41	10/50	20/68	30/86	35/95
	(%)	<1	0	0	0	0	0

World market price	(U.S. $/MT)	min	Ø	max
	1970–1995	208	480	968
Price index (1995 average compared to average)	1967–1970	236	287	359
10 years ago 118%	1970–1979	208	499	968
20 years ago 116%	1980–1989	199	464	863
25 years ago 213%	1990–1995	385	498	731

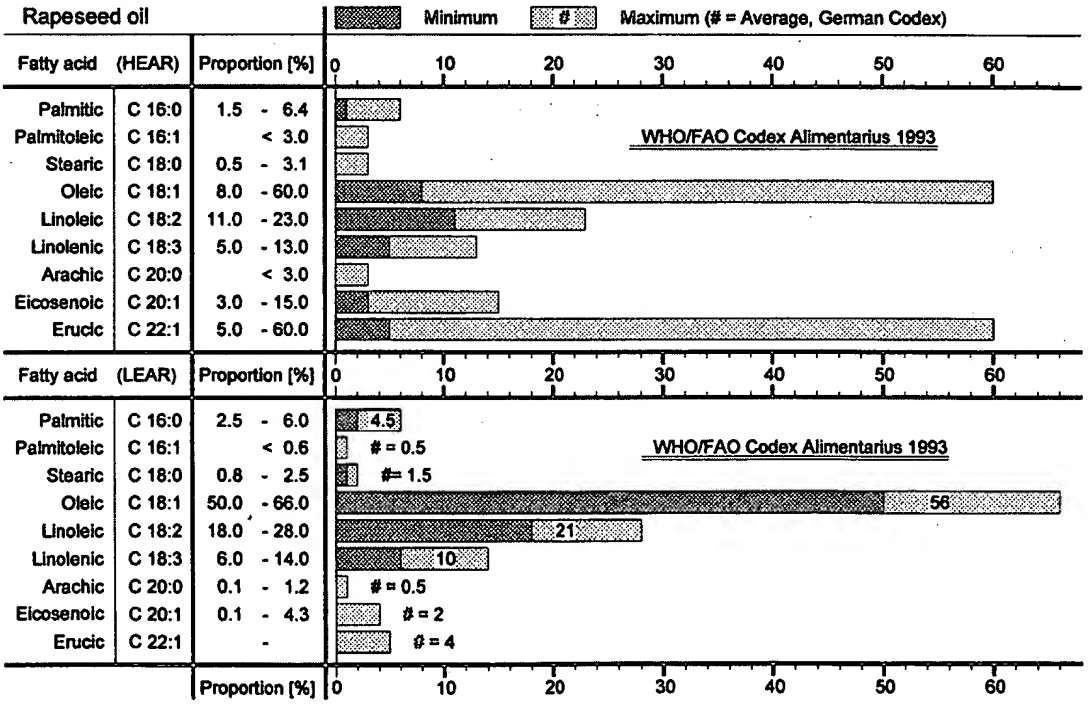

Fig. 4.83. Fact file of rapeseed oil (fatty acid composition).

TABLE 4.53
Fact File of Palm Kernel Oil

German: Palmkernfett	French: huile de palmiste	Spanish: aceite de palmiste
Relative density	(at 40°C; ref. water 20°C)	0.899–0.914
Refractive index	(n_D^{40})	1.448–1.452
Saponification value	(mg KOH/g oil)	230–254
Iodine value	(Wijs method)	14–20
Reichert value		4–7
Polenske value		8–12
Unsaponifiable matter	(g/kg oil)	<10

Melting point:	25–30°C	Solidification point	20–24°C

Solids content at	(°C/°F)	10/50	15/59	20/68	25/77	30/86	35/95
	(%)	70	59	39	17	0.5	0

World market price	(U.S. $/MT)	min	Ø	max
Price index (1990 average compared to average)	1972–1995	216	589	1322
10 years ago 97%	1972–1979	218	607	1322
15 years ago 103%	1980–1989	216	575	1232

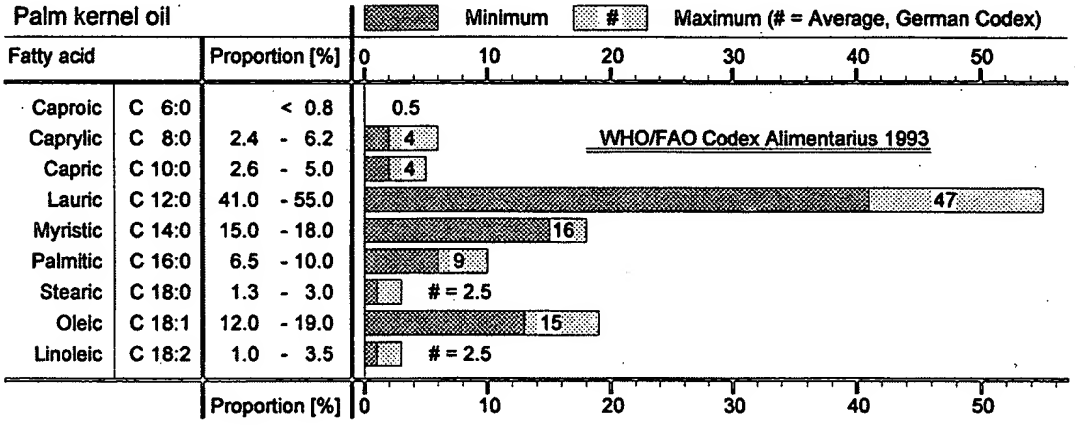

Fig. 4.105. Fact file of palm kernel oil (fatty acid composition).

decreased. Today, in some parts of Europe, there is a revival triggered by the Green movement and promoted by new varieties.

Linseed requires mean temperatures of 18–21°C. In warmer regions such as India, it is a winter crop because too high temperatures lead to plant diseases that do not occur at lower temperatures.

After fading of the white to blue-violet flowers, a 6- to 8-mm capsule develops that holds the shiny deep brown seeds in two chambers of two seeds each (Fig. 4.106; for seed composition, see Fig. 4.107). The seeds have a long, oval shape and are ~4 mm in length. Depending on whether the plant is cultivated for the flax

Webster's Third New International Dictionary

OF THE ENGLISH LANGUAGE UNABRIDGED

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marching unit esp. a military ... troops into their country〉 (2) : direction of movement : COURSE 〈did not like the current ~ of public opinion〉 **c** : a long usu. tiring journey usu. on foot 〈were not happy at the thought of a ~ to the top of the mountain〉 **2** : an instrumental or vocal composition that is in duple rhythm (as ¼ time) or triply compound rhythm (as ⅝ time) with a strongly accentuated beat and that is designed or suitable for the accompaniment and guidance of marching **3** : the taking of all five tricks by one side in the game of euchre — **on the march** : moving along steadily : ADVANCING 〈saw that industrial improvement was *on the march*〉 : MARCHING 〈troops that were constantly *on the march*〉 — **steal a march on** *also* **get a march on** : to get ahead of or win an advantage over esp. unexpectedly and with sly adroitness 〈*stole a march on* his competitors by being the first to put the product on the market〉

march *abbr, often cap* marchioness

mar·chant \'märchənt\ *archaic var of* MERCHANT

mar·chan·tia \mär'shantēə\ *n* [NL, fr. Nicolas *Marchant* †1678 Fr. botanist + NL *-ia*] **1** *cap* : the type genus of Marchantiaceae comprising liverworts that reproduce asexually by gemmae and have stalked antheridiophores **2** -s : any liverwort of the genus *Marchantia*

mar·chan·ti·a·ce·ae \=ˌ==ˈāsēˌē\ *n pl, cap* [NL, fr. *Marchantia*, type genus + *-aceae*] : a family of liverworts (order Marchantiales) with prostrate usu. dichotomously branched thalli and archegonia on specialized upright branches — see MARCHANTIA — **mar·chan·ti·a·ceous** \=ˌ==ˈāshəs\ *adj*

mar·chan·ti·a·les \=ˌ==ˈāˌlēz\ *n pl, cap* [NL, fr. *Marchantia* + *-ales*] : an order of Hepaticae comprising liverworts in which the gametophyte is differentiated internally into ventral storage tissue sometimes enclosing primitive conducting tissue and into a dorsal region of air chambers and in which the sporophyte has a jacket layer that is only one cell thick — see MARCHANTIACEAE

march brown *n, usu cap M & often cap B* **1** : a mayfly (*Ecdyurus venosus*) mostly brown and striped with yellow **2** : an angler's fly made to imitate the March brown mayfly

märchen \'me(ə)rkən, *G* 'meer\ *n, pl* **märchen** [G, fr. MHG *merechyn* short verse narrative, fr. *mære* report, narrative (fr. OHG *mārī, māri*, fr. *māri* famous) + *-chyn*, dim. suffix, fr. OHG *-chīn;* akin to OE *mǣre* famous, ON *mærr* famous, OE *māra* larger, more — more at MORE, -KIN] : TALE; *esp* : FOLKTALE

march·er \'märchə(r), 'mȧch-\ *n* -s [ME *marchier, marchere*, fr. *marche* border region + *-er, -ier, -ere, -iere* -er] **1** : one that inhabits a border region **2** : a lord enjoying royal liberties and having jurisdiction over territory in the English marches — called also *lord marcher*

marches *pl of* MARCH, *pres 3d sing of* MARCH

mar·che·sa \mär'kāzə\ *n, pl* **marche·se** \-(ˌ)zā\ [It, fem. of *marchese*] : an Italian woman holding the rank of a marchese : MARCHIONESS

mar·che·se \-(ˌ)zā\ *n, pl* **marche·si** \-(ˌ)zē\ [It, fr. ML *marcensis*, fr. *marca* border region, of Gmc origin; akin to OHG *marha* boundary — more at MARK] : an Italian nobleman next in rank above a count : MARQUIS

mar·chesh·van \mär'keshvən\ *n* -s *usu cap* [Heb *marḥeshwān*] : HESHVAN

mar·chet \'märchət\ *or* **mar·che·ta** \mär'kād·ə\ *also* **mer·chet** \'mərchət\ *n* -s [ME *merchet*, fr. AF, fr. L *mercatus* trade, market place — more at MARKET] : a fee paid to a British feudal lord by his tenant for marrying off a daughter or son esp. to one outside the lord's jurisdiction or for the lord's waiving the droit du seigneur

march fly *n, usu cap M* **1** : a fly of the family Bibionidae that usu. appears in early spring **2** *Austral* : HORSEFLY

marching fire *n* : ASSAULT FIRE

marching flank *n* : the flank of a military command farthest from the pivot when executing a change of direction

marching orders *n pl* **1** : orders to set out on a march : orders to proceed 〈the division got its *marching orders* one day before the attack〉 **2** : a notice of dismissal (as from a job) 〈did very poor work and soon got his *marching orders*〉

mar·chio·ness \'märsh(ə)nəs, 'mȧsh-\ *n* -ES [ML *marchionissa, marcionissa*, fr. *marchion-, marchio* marquis (fr. *marca* border region) + LL *-issa* -ess] **1** : the wife of a marquess **2** : a woman who holds in her own right the rank of marquess

march king of arms *usu cap M&K&A* [*²march*] : an English king of arms of the late medieval period who had jurisdiction in the west of England and in Wales and Cornwall and whose province was later divided between Clarenceux King of Arms and Norroy King of Arms

marchland \'=ˌ=\ *n* : land in or along border regions : BORDERLAND

march·man \'=mən\ *n, pl* **marchmen** [ME *marcheman*, fr. *marche* border region + *man* — more at MARCH] : MARCHER 1

march–order \'=ˌ==\ *vt* : to ready (arms or other military equipment) for marching 〈*march-ordered* the artillery〉

march·pane \'märchˌpān, 'mȧch-\ *n* -s [It *marzapane* — more at MARZIPAN] : MARZIPAN

march·past \'=ˌ=\ *n, pl* **march–pasts** : a filing by : PROCESSION 〈reviews with relish the *march-past* of his years —*New Yorker*〉; *specif* : a ceremonious procession or parade of marching units esp. of troops that file in review before inspectors or spectators

mar·cion·ism \'märshəˌnizəm\ *n* -s *usu cap* [*Marcion*, 2d cent. A.D. Christian Gnostic + E *-ism*] : the doctrine of the Marcionites

mar·cion·ite \-ˌnīt\ *also* **mar·cion·ist** \-ˌnəst\ *n* -s *usu cap* [LL *marcionita, marcionista*, fr. *Marcion* + L *-ita* -ite or L *-ista* -ist] : a member of an anti-Judaic Gnostic sect that flourished from the 2d century to about the 7th century A.D.

mar·co·man·ni \ˌmärkə'maˌnī\ *n pl, usu cap* [L *Marcomani, Marcomanni*] : an ancient Germanic people related to the Suevians

¹mar·co·ni \mär'kōnē, mȧ'k-\ *adj, usu cap* [Guglielmo *Marconi* †1937 Ital. electrical engineer and inventor] : of or relating to the system of wireless telegraphy invented by Marconi 〈a *Marconi* aerial〉

²marconi \"\ *vt* **marconied; marconied; marconiing; marconies** : to send (a message) by radiogram

³marconi \"\ *adj, usu cap* [prob. so called fr. the resemblance of the complex system of struts and stays formerly characteristic of the Bermuda rig to the poles and stays used in wireless telegraphy] : of, relating to, or marked by a Bermuda rig 〈a *Marconi* mainsail〉

mar·co·ni·gram \-ˌgram\ *n* [*¹marconi* + *-gram*] : RADIOGRAM

mar·co·ni·graph \-ˌgraf, -ˌräf\ *n* [*¹marconi* + *-graph*] : apparatus for wireless telegraphy

Croatian *mora*, and prob. to Gk *marainein* to waste away — more at SMART] *obs* : an evil preternatural being conceived of as causing nightmare

²mare \'ma(ə)ər, 'me|, |ə\ *n* -s [ME *mare, mere*, fr. OE *mere;* akin to OHG *merha* mare, ON *merr* mare, OE *mearh* horse, OHG *marah*, ON *marr*, W *march*] **1** : a female horse or other equine animal esp. when fully mature or of breeding age — compare FILLY **2** *chiefly Scot* : TRESTLE 1a

³ma·re \'mäˌ(ˌ)rē, 'ma(a)|, 'mäˌ|(ˌ)rā\ *n, pl* **ma·ria** \|rēə\ [NL, fr. L, sea — more at MARINE] : one of several dark areas of considerable extent on the surface of either the moon or Mars

ma·re·ca \mə'rēkə\ *n, cap* [NL, fr. Pg *marreca* wild duck] : a genus comprising the widgeons

mare clau·sum \-'klōsəm, -'klau̇zəm\ *n* [NL, closed sea] : a sea or other navigable body of water that is under the jurisdiction of one nation and that is closed to other nations

ma·re·han \'märə,hän\ *n, pl* **marehan** *or* **marehans** *usu cap* **1** : a negroid people of Somaliland in the eastern part of Africa **2** : a member of the Marehan people

mare li·be·rum \-'libərəm, -'lēbəˌrüm\ *n* [NL, free sea] **1** : a sea or other navigable body of water that is open to all nations **2** : FREEDOM OF THE SEAS

ma·rem·ma \mə'remə\ *n* -s [It, fr. ML *maritima* places near the sea, fr. L, neut. pl. of *maritimus* maritime — more at MARITIME] : swampy coastland

mar·eng cell \'mȧˌreŋ-\ *n, usu cap M* [*mareng* fr. Glenn L. *Martin b*1886 Am. airplane manufacturer + E *engineering*] : a fuel container made of airplane cloth impregnated inside and outside with a synthetic rubber that tends to seal up punctures

ma·ren·go \mə'reŋ(ˌ)gō\ *adj, often cap* [F, fr. *Marengo*, village in northwest Italy; prob. fr. the serving of a chicken marengo to Napoleon after his victory over the Austrians at Marengo in 1800] : of, consisting of, or served with a sauce made of mushrooms, tomatoes, olives, oil, and wine 〈sautéed chicken ~〉

mare nos·trum \-'nästrəm, -'nȧˌstrüm\ *n* [L, our sea; fr. the fact that the Roman Empire at its greatest extent included all lands bordering on the Mediterranean] : a sea or other navigable body of water that belongs to a single nation or that two or more nations share by mutual agreement

mareograph *var of* MARIGRAPH

mare's nest *n, pl* **mare's nests** *or* **mares' nests** **1** : a hoax or fraud or some other nonexistent or illusory thing that seems at first to be very wonderful and full of promise but that ultimately brings ridicule on those deceived by it 〈creating a neat little *mare's nest* in English dramatic history —R.S.Loomis〉 〈spent his whole life looking for what was actually a *mare's nest*〉 **2** : a place, condition, or situation of great untidiness, disorder, or confusion 〈the hold of the ship was a *mare's nest*〉 〈had made a *mare's nest* of the administration〉

mare's tail *n* **1** *pl* **mare's tails** *or* **mares' tails** : a cirrus cloud that has a long slender flowing appearance **2** *pl mare's tails* **a** : a common aquatic plant (*Hippuris vulgaris*) with elongated shoots clothed with dense whorls of subulate leaves **b** : HORSETAIL 2 **c** : HORSEWEED 1

ma·rey's law \mə'rāz-\ *n, usu cap M* [after Étienne Jules *Marey* †1904 Fr. physiologist] : a statement in physiology: heart rate is related inversely to arterial blood pressure

mar·fire \'mär,fī(ə)r\ *n* [perh. fr. E dial. *mar* (alter. of E *¹mere*) + E *fire*] *dial Eng* : phosphorescence occurring on the sea

marg *abbr* margin; marginal

mar·ga \'märgə\ *n* -s [Skt *mārga* path, fr. *mṛga* deer, gazelle] **1** *Hinduism* : one of several ways of approaching salvation — compare BHAKTI-MARGA **2** : EIGHTFOLD PATH

mar·ga·rate \'märgəˌrāt\ *n* -s [ISV *margaric* (in *margaric* acid) + *-ate*] : a salt or ester of margaric acid

mar·ga·ret grunt \'märg(ə)rət-\ *n* [*margaret* by folk etymology (influence of the name *Margaret*) fr. *margate*] : MARGATE a

mar·gar·ic acid \mär|'gärik-, mȧ|, |'garik-, 'märˌgərik-, 'mȧ|, -rēk-\ *n* [*margaric* fr. F *margarique*, fr. *margar-* (fr. *margarine* margarin) + *-ique* -ic] **1** : a crystalline synthetic fatty acid $CH_3(CH_2)_{15}COOH$ intermediate between palmitic acid and stearic acid — called also *heptadecanoic acid* **2** : a mixture of palmitic acid and stearic acid obtained from various natural fats, oils, and waxes and formerly mistaken for a single acid

mar·ga·rin \'märgərən\ *n* -s [F *margarine*, fr. Gk *margaron* pearl + F *-ine* -in] : a glycerol ester of margaric acid; *esp* : glycerol tri-margarate

mar·ga·rine *also* **mar·ga·rin** \'märjˌ|(ə)rən, 'mȧj| *also* |ə,rēn *sometimes* -ärg| *or* -ȧg| *or* ˌ=ə'rēn\ *n* -s [F, lit., margarin] : a food product that is used as a substitute for butter and made from a blend of refined oils esp. vegetable oils (as cottonseed oil, soybean oil) to which other ingredients (as salt, emulsifiers, vitamin A, vitamin D) are added and that is churned with ripened skim milk so as to have a consistency that permits ready spreading

mar·ga·ri·ta·ceous \ˌmärgərəˈtāshəs\ *adj* [L *margarita* pearl + E *-aceous*] : having a satiny iridescence like that of pearl or mother-of-pearl : PEARLY

mar·ga·rite \'märgəˌrīt\ *n* -s [ME, fr. MF, fr. L *margarita*, fr. Gk *margaritēs*, fr. *margaron* pearl (prob. fr. Skt *mañjara* pearl, cluster of blossoms) + *-ītēs* -ite] **1** *archaic* : PEARL **2** [G *margarit*, fr. Gk *margaritēs* pearl] : a mineral $CaAl_4Si_2O_{10}(OH)_2$ consisting of a basic aluminum calcium silicate related to mica but low in silica and yielding brittle folia marked by a pearly luster **3** [F *margarite*, fr. Gk *margaritēs* pearl] : a primary form of rock crystallization in which globulites are arranged lineally like beads **4** [NL *Margarites*] : a top shell of the genus *Margarites*

mar·ga·ri·tes \ˌmärgəˈrīˌdēz\ *n, cap* [NL, fr. Gk *margaritēs* pearl] : a genus of minute top shells that are widely distributed in cold northern seas and that are an important item of diet for cod and other fishes

mar·ga·ro·des \ˌmärgəˈrōˌdēz\ *n, cap* [NL, fr. Gk *margaron* pearl + NL *-odes*] : a genus of scales — see GROUND PEARL

mar·ga·ro·dite \'märgərōˌdīt\ *n* -s [G *margarodit*, fr. MGk *margarōdēs* like a pearl (fr. Gk *margaron* pearl + *-ōdēs* -ode) + G *-it* -ite] : a pearly common mica resembling talc

mar·gar·o·pus \mär'garəpəs\ *n, cap* [NL, fr. Gk *margaros* pearl oyster (fr. *margaron* pearl) + NL *-pus*] : a genus of ixodid ticks that in some classifications includes the cattle tick

mar·ga·ro·san·ite \ˌmärgəˈrōsᵊnˌīt\ *n* -s [Gk *margaron* pearl + *sanis* board + E *-ite;* fr. its pearly luster and lamellar structure; prob. akin to Gk *sathē* penis, *saineln* to wag the tail, OE *thūma* thumb — more at THUMB] : a mineral $PbCa_2(SiO_4)_2$ consisting of a lead calcium silicate occurring in color

REFERENCE 3

codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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CODEX ALIMENTARIUS COMMISSION
Twenty-fourth Session
Geneva, Switzerland, 2-7 July 2001

REPORT OF THE SEVENTEENTH SESSION OF THE CODEX COMMITTEE ON FATS AND OILS
London, United Kingdom
19 – 23 February 2001

Note: This document incorporates Codex Circular Letter 2001/4-FO

Table 1: Fatty acid composition of vegetable oils as determined by gas liquid chromatography from authentic samples [1] (expressed as percentage of total fatty acids) (see Section 3.1 of the Standard) (continued)

Fatty acid	Palm stearin	Rapeseed oil	Rapeseed oil (low erucic acid)	Safflowerseed oil	Safflowerseed oil (high oleic acid)	Sesameseed oil	Soyabean oil	Sunflowerseed oil	Sunflowerseed oil (high oleic acid)
C18:1	15.5-36.0	8.0-60.0	51.0-70.0	8.4-21.3	70.0-83.7	35.9-42.3	17-30	14.0-39.4	75-90.7
C18:2	3.0-10.0	11.0-23.0	15.0-30.0	67.8-83.2	9.0-19.9	41.5-47.9	48.0 -59.0	48.3-74.0	2.1-17
C18:3	ND-0.5	5.0-13.0	5.0-14.0	ND-0.1	ND-1.2	0.3-0.4	4.5-11.0	ND-0.3	ND-0.3
C20:0	ND-1.0	ND-3.0	0.2-1.2	0.2- 0.4	0.3-0.6	0.3-0.6	0.1-0.6	0.1-0.5	0.2-0.5
C20:1	ND-0.4	3.0-15.0	0.1-4.3	0.1- 0.3	0.1-0.5	ND-0.3	ND-0.5	ND-0.3	0.1-0.5
C20:2	ND	ND-1.0	ND-0.1	ND	ND	ND	ND-0.1	ND	ND
C22:0	ND-0.2	ND-2.0	ND-0.6	ND-1.0	ND-0.4	ND-0.3	ND-0.7	0.3-1.5	0.5-1.6
C22:1	ND	> 2.0-60.0	ND-2.0	ND-1.8	ND-0.3	ND	ND-0.3	ND-0.3	ND-0.3
C22:2	ND	ND-2.0	ND-0.1	ND	ND	ND	ND	ND-0.3	ND
C24: 0	ND	ND-2.0	ND-0.3	ND-0.2	ND-0.3	ND-0.3	ND-0.5	ND-0.5	ND-0.5
C24:1	ND	ND-3.0	ND-0.4	ND-0.2	ND-0.3	ND	ND	ND	ND

ND - non detectable, defined as ≤ 0.05%

[1] Data taken from species as listed in Section 2.

all the soy goodness
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without the soy taste

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REFERENCE 4

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ORGANIC SOYBEAN OIL SPECIFICATION SHEET

DESCRIPTION: All Nexsoy Soybean Oils are naturally expelled soybean oils, which have been expelled without the use of solvents or other chemicals. The bulk organic soybeans are first cleaned of all foreign matter before they are mechanically extruded. The resulting meal is then mechanically expelled, after which the oil is sent to storage tanks. The soy oil is naturally cold-pressed, which provides the maximum amount of tocopherols.

PRODUCT: **Crude**, Naturally Expelled Organic Soybean Oil, Certified Kosher**

SHELF LIFE: Minimum of three years at room temperature and dim light.

TYPICAL ANALYSIS:

*Appearance:	Brilliant Dark Golden	*Moisture & Volatiles %:	.03%
*Free Fatty Acid, % max:	3%	*Total Tocopherols, ppm:	1516
*Phosphorus, ppm:	200	*Color: Yellow	40
*Peroxide Value (meq/kg):	0.3	Red	3.5
*Iodine Value:	133	*Flash Point, Degrees F:	300 Degrees F

FATTY ACID COMPOSITION, %

C16: 0 Palmitic	10.14%	C18: 2 Linoleic	51.47%	C22: 0 Behenic:	0.37%
C17: 0 Margaric	0.11%	C18: 3 Linolenic	8.31%	C24: 0 Lognoceric:	0.12%
C18: 0 Stearic	4.20%	C20: 0 Arachidic	0.35%	Other:	0.17%
C18: 1 Oleic	24.31%	C20: 1 Gadoleic	0.19%		

* Applications: Used by manufacturers for cooking oil, baked goods, among others. Not for frying.
** Available as Non-GMO or Organically Certified Non-GMO

PRODUCT: **Degummed**, Naturally Expelled Organic Soybean Oil, Certified Kosher**

SHELF LIFE: Minimum of three years at room temperature and dim light.

TYPICAL ANALYSIS:

*Appearance:	Brilliant Dark Golden	*Moisture & Volatiles %:	.03%
*Free Fatty Acid, % max:	3%	*Total Tocopherols, ppm:	1447
*Phosphorus, ppm:	25	*Color: Yellow	40
*Peroxide Value (meq/kg):	0.3	Red	3.5
*Iodine Value:	133	*Flash Point, Degrees F:	560 Degrees F

FATTY ACID COMPOSITION, %

C16: 0 Palmitic	10.14%	C18: 2 Linoleic	51.47%	C22: 0 Behenic:	0.37%
C17: 0 Margaric	0.11%	C18: 3 Linolenic	8.31%	C24: 0 Lognoceric:	0.12%
C18: 0 Stearic	4.20%	C20: 0 Arachidic	0.35%	Other:	0.17%
C18: 1 Oleic	24.31%	C20: 1 Gadoleic	0.19%		

* Applications: Used by manufacturers for cooking oil, frying, baked goods, among others.
** Available as Non-GMO or Organically Certified Non-GMO

PRODUCT: **Refined, Bleached & Deodorized**, Naturally Expelled Organic Soybean Oil, Certified Kosher**

SHELF LIFE: Minimum of one year at room temperature and dim light.

TYPICAL ANALYSIS:

*Appearance:	Brilliant Light Golden	*Moisture & Volatiles %:	.06%
*Free Fatty Acid, % max:	0.03%	*Total Tocopherols, ppm:	1250
*Phosphorus, ppm:	3	*Color: Yellow	5.80
*Peroxide Value (meq/kg):	0.70	Red	0.60
*Iodine Value:	132	*Flash Point, Degrees F:	570 Degrees F

FATTY ACID COMPOSITION, %

C16: 0 Palmitic	10.14%	C18: 2 Linoleic	53.10%	C22: 0 Behenic:	0.37%
C17: 0 Margaric	0.11%	C18: 3 Linolenic	7.9%	C24: 0 Lognoceric:	0.12%
C18: 0 Stearic	4.20%	C20: 0 Arachidic	0.20%	Other:	0.17%
C18: 1 Oleic	23.10%	C20: 1 Gadoleic	0.19%		

* Applications: Used by manufacturers for cooking oil, frying, baked goods, among others.
** Available as Non-GMO or Organically Certified Non-GMO
Nexsoy® Oils are produced by Thumb Oilseed Producers Cooperative in Ubly, MI and are marketed and sold exclusively by Spectrum Foods, Inc.